AF/3622

<u>CUSTOMER NUMBER **27792**</u>

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	Jason Wilcox et al.	Attorney Docket No: MICR0216
Serial No:	09/596,195	Group Art Unit: 3622
Filed:	June 17, 2000	Examiner: Duran, Arthur D.
Title:	INVENTORY MANAGEMENT	

<u>APPEAL BRIEF TRANSMITTAL LETTER</u>

Bellevue, Washington 98004
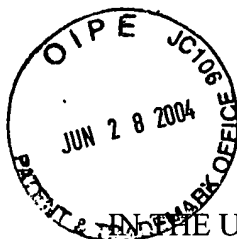
June 23, 2004

TO THE COMMISSIONER FOR PATENTS:

Enclosed herewith for filing in the above-identified patent application is an Appeal Brief in triplicate. Also enclosed is our check No. 7488 in the amount of $330 . Please charge any additional fees or credit any overpayment to Deposit Account No. 01-1940. A copy of this sheet is enclosed.

Respectfully submitted,

Ron Anderson

Ronald M. Anderson
Registration No. 28,829

I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on June 23, 2004.

Date: June 23, 2004

Kathy Pan

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

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APPEAL BRIEF

Bellevue, Washington 98004

June 23, 2004

TO THE DIRECTOR OF THE PATENT AND TRADEMARK OFFICE:

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This is an appeal from a final rejection by Examiner Duran of Group Art Unit 3622. A Final Rejection was mailed on November 24, 2003. Appellants filed a timely Notice of Appeal and request for extension of time on April 23, 2004.

The jurisdiction of this board is invoked under the provisions of 35 U.S.C. § 134 and 37 C.F.R. §§ 1.191-192.

REAL PARTY OF INTEREST

The real party of interest in this appeal is hereby identified as Microsoft Corporation, since all right and title in the invention and in the patent application on appeal has been assigned to Microsoft Corporation, as evidenced by a chain of title from the inventors of the patent application identified above to the current assignee, as shown below:

1. From inventors **Jason Wilcox** (assignment executed June 7, 2000), and **Pavel M. Rozalski** (assignment executed June 7, 2000) to **Microsoft Corporation**. The assignment was recorded in the Patent and Trademark Office on June 17, 2000 at Reel 010912, Frame(s) 0367.

RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known to appellants, appellants' undersigned legal representative, or by the assignee of this application that will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

STATUS OF THE CLAIMS

Claims 1-21 remain pending in the application on appeal. No claims have been canceled. Appellants hereby appeal the final rejection of Claims 1-21.

STATUS OF THE AMENDMENTS

An Amendment and Request for Reconsideration in response to the Final Office Action in this application was mailed on February 18, 2004. An Advisory Action dated March 8, 2004 indicated the amendment was not entered because the proposed amendment was not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.

In the Amendment and Request for Reconsideration mailed on February 18, 2004, appellants attempted to amend Claims 18, 19, and 21 to introduce an element that was already recited in other pending claims. Entry of this amendment should have been viewed as reducing or simplifying the issues for appeal, by making these three pending claims more similar to other claims pending in the application. Since Claims 18, 19, and 21 now lack an element recited in other pending claims, they will now require a separate analysis. Because the after Final Office Action amendment was not entered, the complexity of the issues for appeal has been increased, rather than simplified.

A copy of the claims on appeal, including all amendments actually entered into the application, is appended hereto.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

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SUMMARY OF THE INVENTION

The present invention is directed to a method for filling an inventory of empty slots with items, by creating organizational structures that can be manipulated to control how the empty slots are filled. In one preferred embodiment, each slot corresponds to space on a webpage where an ad can be displayed, and each item corresponds to an ad (such as a banner ad). The method enables the empty slots to be filled, such that items of a second type are placed into slots with more specificity than items of a first type. Preferably, items of the second type (those items placed into slots with greater specificity) correspond to ads from paying advertisers (sponsor ads), and items of the first type (those items placed into slots with less specificity) correspond to ads from non-paying advertisers (member ads). This functionality is desirable to enable ads for paying advertisers to receive preferential placement. The method also enables items that are more narrowly defined (such as ads related to football) to be added to fill open slots *before* items that are more broadly defined (such as ads related to sports in general, and not just football). This approach is desirable because more narrowly defined ads often earn more revenue than more broadly defined ads (such as ads related to sports in general, and not just football), particularly when there is a correlation between a specific location (such as a webpage for fans of a particular professional football team) and the more narrowly defined content (such as ads related to football). Thus, items can be organized based on characteristics such as the content of the item and ownership of the item. With the exception of Claim 1, each independent claim recites organizing item slots into two distinctly different organizational structures (item slot groups and meta item slot groups), and using those two different organizational structures to enable items of a first type (expressing only a broad characteristic) and items of a second type (expressing both a broad characteristic and a narrow characteristic) to be allocated to open item slots, such that the items of the second type are allocated to open slots with a greater specificity.

The present invention may be better understood in the context of appellants' related business model. Appellants' invention was developed in the course of managing an ad matching service, where sponsors paid money to the ad matching service to have the sponsor's ads displayed on webpages associated with the ad matching service. The ad matching service displayed the sponsor ads on the webpages owned by member sites. The member sites were not paid for this activity; instead, the member sites were rewarded by having their own ads placed on the webpages of other member sites for free. The ad matching service had to manage a large inventory of empty slots

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

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(portions of the webpages where ads could be displayed), while ensuring that sponsor ads (i.e., paying advertisers ads) were placed with a higher priority than ads for member sites. Furthermore, some ads were more specific than other ads, and greater care needed to be taken to place the more specific ads. For example, an ad for a sports periodical would preferably be displayed on any webpage dealing with sports (such as a webpage dealing with football or baseball), while an ad for football would preferably be displayed on a webpage dealing with football, but not on a webpage dealing with baseball. The present invention enabled the ad matching service to manage the large inventory of empty slots, to ensure that while ads for member sites were displayed where possible, paying advertisers received better service (for example, paying advertisers' ads were more closely matched to the content of the webpages where the ads were displayed).

Thus, in one preferred embodiment of appellants' invention, in a first step, a determination is made as to how many item slots available in an inventory are empty. For example, this step could be implemented by determining how many spaces were available on webpages where ads could be placed. Each item slot can be filled by either an item of a first type having a corresponding meta characteristic and no group characteristic, or an item of a second type having both a corresponding meta characteristic and a corresponding group characteristic. Meta characteristics correspond to broad categories, such as sports, whereas group characteristics are for more narrowly defined categories, such as football and baseball. Independent Claims 1, 8, 13, and 20 recite the step of determining how many item slots (i.e. spaces) available in an inventory are empty.

The empty item slots are organized into a first type of organizational structure, item slot groups, such that a different item slot group is constructed for each different group characteristic. For example, where the item slots correspond to webpages related to baseball, to football, and to video games, then three different item slot groups would be generated. Assuming the baseball webpages have space for 70 ads, the football webpages have space for 80 ads, and the video game webpages have space for 60 ads, then the item slot group for baseball would include 70 slots, the item slot group for football would include 80 slots, and the item slot group for video games would include 60 slots. Each independent claim recites the step of organizing the empty slots into item slot groups based on shared characteristics (i.e. a different item slot group is constructed for each different group characteristic).

Next, a second type of organization structure is generated. Meta item slot groups are constructed for each different meta characteristic that can be used to fill the item slots. In the above

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example, sports and gaming are meta characteristics. Sports encompasses football and baseball, and gaming encompasses video games. The sports meta slot group, in this example, includes 150 slots (70 slots corresponding to the baseball item slot group, and 80 slots corresponding to the football item slot group). The gaming meta slot group, in this example, includes 60 slots (corresponding to the video game item slot group). Independent Claims 8, 13, 18, 19, 20 and 21 recite the step of constructing meta item slot groups (one for each different meta characteristic that can be used to fill an item slot).

Now that the meta item slot group and item slot group organizational structures are completed, allocating ads to specific item slots (inventory spaces) can begin. Independent Claims 8, 13, 18, 19, 20 and 21 recite generally similar steps of allocating items to the slots of the two different organizational structures (the item slot groups and the meta item slot groups), such that items of the second type are allocated to slots with a greater specificity. To understand this process, it may be helpful to review the following graphics, which although not included in this application, are entirely consistent with the Figures and text of the present application on appeal. It should be noted that the following graphics are based on FIGURES 3, 4, 5, and 9, of the specification as filed, and the disclosure related to the second operative example (see page 19, line 10, to page 21, line 21) and the method of FIGURE 9 (see page 27, line 15 to page 28, line 16). FIGURES 3, 4, and 5 as filed are histograms, with the bars in FIGURES 3 and 4 corresponding to item slot groups, and the bars of FIGURE 5 corresponding to meat item slot groups. The most significant differences between the graphics below and FIGURES 3, 4, and 5 is that in the graphics below, both meta item slot groups and the item slot groups are shown together (rather than being shown on separate drawing sheets, thereby making their relationship to one another more apparent), and that individual item slots are represented by discrete boxes, making the number of item slots in each item slot group and meta item slot group easier to visualize (in FIGURES 3, 4, and 5 the height of the bars correspond to the number of item slots, and the meta item slot bars of FIGURE 5 are clearly disclosed as encompassing all the item slots from the item slot groups of FIGURE 3). Thus, the graphics below do not represent added matter and are included herein simply to enable the method disclosed in the specification as filed to be more readily visualized and to facilitate an understanding of appellants' invention.

Graphic 1 facilitates the visualization of block 902 of FIGURE 9, in which the item slot groups and meta item slot groups of FIGURES 3, 4, and 5 are constructed. Once again, each

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independent claim recites the step of organizing item slots into item slot groups, and independent Claims 8, 13, 18, 19, 20 and 21 each recite the step of constructing meta item slot groups.

Assume an inventory includes baseball related webpages with space for 4 ads, football related webpages with space for 3 ads, video game related webpages with space for 3 ads, and board game related webpages with space for 2 ads. Item Slot Group 1 corresponds to the baseball related webpages and has 4 slots, Item Slot Group 2 corresponds to the football related webpages and has 3 slots, Item Slot Group 3 corresponds to the video gaming webpages and includes 3 slots, and Item Slot Group 4 corresponds to the board game webpages and includes 2 slots.

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┌─┬─┬─┬─┬─┬─┬─┐        ┌─┬─┬─┬─┬─┐
└─┴─┴─┴─┴─┴─┴─┘        └─┴─┴─┴─┴─┘

┌─┬─┬─┬─┐   ┌─┬─┬─┐    ┌─┬─┬─┐    ┌─┬─┐
└─┴─┴─┴─┘   └─┴─┴─┘    └─┴─┴─┘    └─┴─┘
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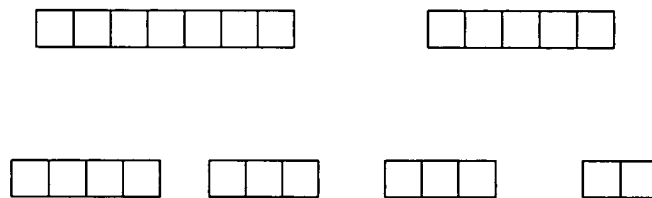
Meta Item Slot Group 1 corresponds to sports related item slots, and includes 7 slots (4 slots from baseball and 3 slots from football), while Meta Item Slot Group 2 corresponds to gaming related item slots, and includes 5 slots (3 slots from video games and 2 slots from board games). Note that the meta item slot groups include the same number of item slots as are present in each item slot group encompassed by the meta item slot group, which does not mean the number of item slots has doubled. Such duplication simply facilitates the allocation of items to slots.

After the meta item slot groups and the item slot groups are constructed, the meta item slot groups are filled with items of the first type, as indicated by "x" and by "y" in Graphic 2, which Graphic 2 facilitates the visualization of block 904 of FIGURE 9. As noted above, independent Claims 8, 13, 18, 19, 20 and 21 recite generally similar steps of allocating items to the meta item slot groups. Preferably, items of the second type are ads from paying advertisers (sponsor ads), while items of the first type are ads from member sites who trade space on their webpages where member ads can be displayed in exchange for their own ads being displayed on other member sites (see page 3, lines 4-12 of appellants' specification). Meta item slot groups are broader than item slot groups, since each meta item slot group can encompass one or more item slot groups (i.e., Item Slot Group 1

and Item Slot Group 2 are encompassed by Meta Item Slot Group 1, while Item Slot Group 3 and Item Slot Group 4 are encompassed by Meta Item Slot Group 2). Items "x" are member sports related ads, while items "y" are member gaming related ads.

Another step is to fill the remaining slots in the meta item slot groups with items of the second type (sponsor ads) having corresponding meta characteristics, as indicated in Graphic 3. Graphic 3 facilitates the visualization of the first component of block 906 of FIGURE 9, in which the items of the second type are distributed to meta item slot groups. Items of the second type "x1" have characteristics matching Meta Item Slot Group 1 and Item Slot Group 1 (e.g., sponsor baseball ads), while items of the second type "x2" have characteristics matching Meta Item Slot Group 1 and Item Slot Group 2 (e.g., sponsor football ads). Similarly, items of the second type "y1" have characteristics matching Meta Item Slot Group 2 and Item Slot Group 3 (e.g., sponsor video game ads), and items of the second type "y2" have characteristics matching Meta Item Slot Group 2 and Item Slot Group 4 (e.g., sponsor board game ads). Note that items of the second type are defined with a greater specificity (i.e., have both a group characteristic and a meta characteristic), because paying advertisers generally want to target their ads with greater specificity.

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Next, the item slot groups are filled using the items of the second type previously used to fill the meta item slot groups, as indicated in Graphic 4 (which facilitates the visualization of the second component of block 906 of FIGURE 9, in which the items of the second type are distributed to item slot groups). As noted above, independent Claims 8, 13, 18, 19, 20 and 21 recite generally similar steps of allocating items to the slots of the item slot groups.
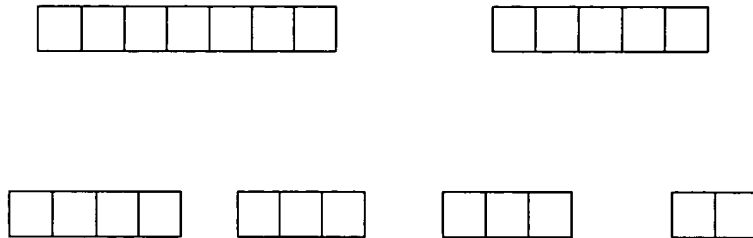
Finally, the empty slots in the item slot groups are filled with items of the first type currently filling the slots in the meta item slot groups, as indicated in Graphic 5, which facilitates the visualization of block 908 of FIGURE 9 (in which the items of the first type are distributed to item slot groups). The item slot groups in Graphic 5 are full and can be used as a guide to indicate how the spaces on the webpages are to be filled. For example, Item Slot Group one corresponds to webpages related to football, and the 4 available spaces will be filled with 3 ads from paying advertisers (items of the second type) and 1 ad from a member site (an item of the first type). The present invention uses organizational structures (meta item slot groups and item slot groups) to facilitate allocation of items to empty slots.
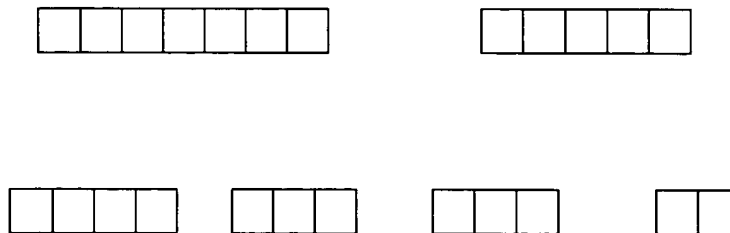
It is important to note that items of the first type (which in one embodiment correspond to ads for non-paying member sites, who are allowed to place ads in exchange for displaying other ads on their own site), are not defined as specifically as the items of the second type (paying advertisers in a preferred embodiment). Thus, member ads (items of the first type) are targeted with less specificity than sponsor ads (items of the second type). An item of the first type in a meta item slot group can be placed in an item slot in any item slot group encompassed by that meta item slot group. Referring to the graphics, each item "x" is only defined in terms of Meta Item Slot Group 1, which encompasses Item Slot Groups 1 and 2. Thus, any item "x" can be placed in any open slot in either of Item Slot Groups 1 and 2. In contrast, item "x1" can only be a member of Item Slot Groups 1.

In other embodiments of the invention, additional levels of differentiation are available, such that meta characteristics, group characteristics, and sub group characteristics are provided, and items of the second type are allocated to item slots with even greater specificity. In yet another embodiment, items are differentiated based only on group characteristics (no meta item slot group organization structures are provided), and once the items are allocated to item slot groups, a histogram is prepared and displayed. While targeted advertising techniques are known, the organization structures recited in appellants' claims, and the manipulation of those structures, are not employed in the prior art.

ISSUES PRESENTED FOR REVIEW

1.   A determination as to whether the invention defined by Claims 8, 13, and 18-21 is patentable under 35 U.S.C. § 103(a) over Brown et al. (U.S. Patent No. 6,026,368), in view of Herz (U.S. Patent No. 6,029,195).

2.   A determination as to whether the invention defined by Claims 1-7, 9-12, and 14-17 is patentable under 35 U.S.C. § 103(a) over Brown (U.S. Patent No. 6,026,368), in view of Herz (U.S. Patent No. 6,029,195), and further in view of Conley, Jr. et al. (U.S. Patent No. 6,434,745).

GROUPING OF CLAIMS

In regard to the rejection of the claims as unpatentable under 35 U.S.C. § 103(a) over Brown (U.S. Patent No. 6,026,368) in view of Herz (U.S. Patent No. 6,029,195), Claims 8, 13, and 20 stand or fall together. Claims 18 and 19 also stand or fall together. Finally, Claim 21 stands or falls separately. Therefore, the rejection based on Brown combined with Herz will require a three-part analysis. The reasons for this grouping will be apparent from the arguments presented below.

In regard to the rejection of the claims as unpatentable under 35 U.S.C. § 103(a) over Brown (U.S. Patent No. 6,026,368), in view of Herz (U.S. Patent No. 6,029,195), and further in view of Conley, Jr. et al. (U.S. Patent No. 6,434,745), Claims 1-7, 9-12, and 14-17 stand or fall together. Thus the rejection based on Brown combined with Herz, in view of Conley, will require a single part analysis. Again, the reasons for this grouping will be apparent from the arguments presented below.

<div align="center">ARGUMENT</div>

Rejection of Claims 8, 13, and 20 under 35 U.S.C. § 103

The Examiner has rejected Claims 8, 13, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Brown et al. (U.S. Patent No. 6,026,368), in view of Herz (U.S. Patent No. 6,029,195). The Examiner indicates that Brown discloses an invention equivalent to that defined by appellants' claims, except that Brown does not teach or suggest filling slots based on hierarchical clustering in which an item in a lower cluster is also a member of each cluster above, and each cluster below is defined more specifically. The Examiner asserts that these portions of appellants' claims are disclosed by Herz. Appellants respectfully disagrees for the following reasons.

It should be noted that independent Claims 8, 13 and 20 share the following elements in common. Each of independent claim recites the step of determining the number of open item slots in an inventory that are empty. Each independent claim recites two different organization structures; item slot groups and meta item slot groups. Each independent claim recites filling the item slot groups and the meta item slot groups such that items of the second type are allocated to empty slots with a greater specificity than items of the first type.

There are two compelling reasons why the proposed combination of Brown and Herz does not achieve an invention equivalent to that defined in appellants' Claims 8, 13 and 20. First, the suggested combination of Herz and Brown is not equivalent to appellants' claimed invention, because the item slot groups (and meta item slot groups) recited in Claims 8, 13 and 20 are not equivalent to either the play lists or priority queues disclosed by Brown, and because the hierarchical clustering disclosed by Herz is not equivalent to the organizational technique recited in appellants' claims. Second, a combination of Herz and Brown would be computationally inefficient and yield no obvious benefit or solve any problem recognized in the cited art. Because such a combination is inefficient and provides no apparent benefit, there would be no motivation for one of ordinary skill

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in this art to make the combination and modifications required to achieve an invention equivalent appellants' claimed invention.

The Examiner asserts that the organizational structures defined in appellants' claims (item slot groups and meta item slot groups) are equivalent to organizational structures disclosed by Brown. Brown discloses several different organizational structures, including priority queues and play lists, neither of which appears equivalent to appellants' recited item slot groups and meta item slot groups.

Brown discloses an invention related to targeted advertising, in which banners ads are placed on webpages based on rules defined by an analyst. A pool of ads are available and can be placed on specific portions of webpages. To make the comparison between Brown and the terms used in appellants' claims more consistent, it will *arguendo* be assumed that "ads" in Brown are equivalent to "items" in appellants' claims, and the "specific portions of webpages" in Brown are equivalent to "slots" as used by appellants. Brown discloses that many different rules can be used to determine how items are targeted to specific slots. Factors that may be used in Brown's item matching include determining an identity of the slot (the kind of webpage to which the space for the ad corresponds), an identity of the user of the item (to whom the ad will be displayed), and characteristics of the item (an ad for sports, and ad for football, etc.).

Brown discloses organizational structures, priority queues, and play lists (each of which are organizational structures that include a plurality of slots that are filled with items), and at first blush, it may appear that these elements are similar to appellants' item slot groups and meta item slot groups. However, upon closer analysis, there are numerous differences between appellants' organizational structures and those recited by Brown, such that appellants' method steps are readily distinguishable over Brown, even in combination with other cited art. Before analyzing the differences between Brown's organizational structures and those recited by appellants' claims, it will be helpful to review the steps disclosed by Brown to target ads.

According to Brown, a plurality of ads (items) will be available to fill empty spaces on webpages (slots). Before an item is assigned to a specific slot, an analyst defines a plurality of rules. Those rules facilitate the determination of which ads to display on a given open space on a webpage. Once the rules are defined, one or more priority queues are generated. A priority queue is an organizational structure that includes ads selected, based on the rules defined by the analyst. The priority queue thus represents a list of ads that can be used to fill available spaces. Brown suggests that many different priority queues should be developed, using many different combinations of rules.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

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Significantly, the priority queues are developed before a determination is made as to how many open slots are available in an inventory. Thus, there is no one-to-one correspondence between the number of ads in a priority queue, or the size of a priority queue, and the number of open slots in an inventory. Once the priority queues are generated, a request for ads can be processed. The request will identify the number of open slots in the inventory (how many ads can be placed) and will generally include sufficient details about the inventory to enable an appropriate priority queue to be selected. Then, a new organizational structure, referred to as a play list, is produced using the priority queues. The play list is then used to fill the item slots in the inventory (i.e., the open spaces on the webpages are filled using the ads in the play list). It is significant to note that Brown does not disclose that there is a one-to-one correspondence between the number of items in a play list and the number of empty slots in an inventory, and even more significantly, Brown discloses that computational resources are expended before a request for content has been received (i.e. before the size of an inventory is determined), to organize the items (the ads) into priority queues, which in turn are used to generate play lists in real time. Brown indicates that this technique enables play lists to be generated very rapidly, and an inventory of open slots to be filled very quickly. Note Brown explicitly teaches that the several key components are off-line components (the Warehouse Manager, the Queue Builder, and the Exposure Accounting Module; see column 4, line 65 to column 5, line 1), while the Queue Manager (which generates play lists based on priority queues produced by the off-line Queue Builder) is an in-line component (see column 5, lines 5-14) configured to generate play-lists in real-time (see column 2, lines 21-23).

Whereas Brown is related art, a reasoned analysis of Brown's disclosure shows that Brown does not employ organizational structures equivalent to those recited in appellants' claims, and Brown does not teach manipulating organization structures in an equivalent manner, even in combination with Herz. Indeed, Brown's method is directed at solving an entirely different problem than that which prompted appellants' invention to be developed. Brown recognizes the value of matching ads to the view of a webpage, and collects information about the time of day, information on the viewer, and information about the webpage on which the ad will be displayed (see column 4, lines 7-15). Based on that set of information, a play list is generated from priority queues generated before the request for the ad was received. Brown explicitly teaches the relatively complex and slow processes of an analyst generating rules for producing priority queues is performed off-line, and that the generation of play-lists from previously developed priority queues occurs on-line in real-time. While embodiments of appellants'

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

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claimed invention are directed to placing ads on webpages, the goal underlying the claimed invention (placing sponsor ads with more specificity than placing member ads) is different than the goal of Brown. Thus, it is not surprising that the specific steps employed by Brown are different than those recited in appellants' claims. In fact, because Brown's configuration of bifurcating the slow and computationally intensive queue building process as an off-line activity, and the computationally efficient generation of play lists from previously generated priority queues as a real-time activity, it can be argued that Brown teaches away from the present invention, which performs computationally intensive manipulations after the number of open slots has been determined (i.e. after receiving a request for content).

Appellants' invention, as defined in independent Claims 8, 13, and 20, employs organizational structures (item slot groups and meta item slot groups) that are very different than Brown's play lists and priority queues for many reasons. First, the item slot groups and meta item slot groups manipulated in appellants' claims are not created until after the number of item slots in an inventory is defined, and there is a one-to-one correspondence between the open slots in an inventory and the aggregate number of item slots in all item slot groups constructed, and all meta item slot groups that are constructed. Second, because meta item slot groups encompass one or more item slot groups, there is an equivalence between the total number of item slots in a meta item slot group, and the total number of time slots in all of the item slots groups encompassed by the meta item slot group. Third, the steps recited by appellants to fill the item slots groups so as to enable items of the second type (sponsor ads) to be placed with more specificity than items of the first type (member ads), are distinguishable from the steps recited by Brown to generate a play list, even when Brown is combined with Herz.

Brown's priority queues are not produced using steps equivalent to the steps recited by appellants for constructing either item slot groups or meta item slot groups, because Brown's priority queues are produced before the number of empty slots in an inventory is determined. Appellants' item slot groups and meta item slot groups are not generated until after the number of slots available in an inventory is determined. Clearly, in Brown, priority queues are generated before determining how many slots are available in an inventory. Thus, the process of generating Brown's priority queues is not equivalent to appellants' claimed steps of generating meta item slot groups and item slot groups. In appellants' claimed invention, computational resources are consumed to organize items only *after* it is determined how many slots are available in an inventory. In contrast, Brown discloses that most of the computational resources are expended before it is determined how many

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slots are available in an inventor, to generate priority queues, while few computational resources are expended *after* it is determined how many slots are available in an inventory, to generate play lists. Furthermore, Herz does not teach or suggest modifying Brown's priority queues such that they are generated after the number of empty slots is determined.

In appellants' claimed invention, there is a one-to-one correspondence between the number of open slots in an inventory and the aggregate number of item slots in all item slot groups constructed, and all meta item slot groups constructed. For example, if there 100 open slots in an inventory, then regardless of how many meta item slot groups are constructed, there must be 100 item slots distributed among those meta item slot groups (and so, if only a single meta item slot group is constructed, it will have 100 item slots). The same result is true for the item slot groups; regardless of how many item slot groups are constructed, if there are 100 item slots available, there must be 100 item slots distributed among the item slot groups (and so, if only a single item slot group is constructed, it will have 100 item slots). This aspect of appellants' invention is logically apparent when one understands that the number of item slots are first identified, then those item slots are placed into item slot groups based on common group characteristics. Meta item slot groups are then constructed, *such that a meta item slot group is constructed for each different meta characteristic that can be used to fill the item slots, each meta item slot group having a number of meta item slots equal to a total number of item slots that can be filled by items having that meta characteristic.* Because meta item slots are based on item slots, the aggregate number of item slots in all meta item slot groups constructed is logically equal to the aggregate number of item slots in all item slot groups constructed. This condition is easily visualized based on the graphics provided above. There is simply no teaching or suggestion in Brown indicating that the aggregate number of item slots in all priority queues constructed is equal to the total number of open slots in an inventory, or equal to the aggregate number of item slots in all play lists constructed. Herz does not provide any disclosure that would lead one of ordinary skill to modify Brown's organizational structures to achieve organizational structure equivalent to those defined by appellants' claims.

Appellants' item slot groups, and Brown's play lists represent organizational structures that define how open slots in an inventory are to be filled. However, the steps recited by appellants to fill an item slot group are distinguishable over the steps disclosed by Brown to fill play lists. Significantly, Brown's play lists are not filled by first allocating items of a second type, followed by allocating items of a first type. In asserting that the combination of Brown and Herz achieves an

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equivalent invention, the Examiner indicates Herz discloses filling slots based on a hierarchical clustering in which an item in a lower cluster is also a member of each cluster above. The Examiner has asserted that Herz's hierarchical clustering enables Brown to organize folders, sub-folders, categories and priority queues to better match items of different priorities, even though neither reference suggests such a combination would be beneficial. No explanation has been provided as to how such a combination would improve Brown's ad matching service, nor has any evidence been presented indicating that one of ordinary skill in the art would have recognized that a combination of Brown and Herz would solve any problem recognized in the art. Furthermore, the Examiner has not articulated how such a modification would achieve an invention equivalent to appellants' claimed invention, particularly in light of appellants' traversal of the rejection showing that Herz's hierarchical clustering is not equivalent to appellants' use of item slot groups and meta item slot groups to allocate items of the first type with greater specificity than items of the first type. Even if one of Brown's play lists were modified according to the hierarchical clustering disclosed by Herz, to achieve an upper order play list and a plurality of lower order play lists in which each lower order play list is defined more specifically, the result would not be equivalent to appellants' claimed invention, because Brown's original play list (which could be reordered into a plurality of more specifically defined play lists according to Herz) is not generated using steps equivalent to those recited by appellants. Even more significantly, the hierarchical clustering disclosed by Herz is *not* equivalent to appellants' claimed approach for filling the item slot groups from meta item slot groups.

According to Herz, each item in a list is sorted, and one sort that can be used is hierarchical, such that each lower cluster (or sub cluster) is more narrowly defined, and *each item in the same cluster* is defined with specificity for that cluster. This condition is not true with respect to how appellants' item slot groups are filled. Appellants' meta item slot groups can each encompass more than one item slot group. For example, a sports meta item slot group can encompass a baseball item slot group and a football item slot groups. According to appellants' claimed method, the sports meta item slot group will be filled first (with items that might include a generic sports ad, a baseball ad, and a football ad). Then the item slot groups are filled with the more narrowly defined items. Football ads go to the football item slot group and the baseball ads go to the baseball item slot group. Then, any additional empty slots in the item slot groups are filled with items that share a broad characteristic, but not the same narrow characteristic. For example, the generic sports ad from the

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Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

sports meta item slot group will be placed in an open slot in either the baseball item slot group or the football item slot group. Thus, when appellants' organizational process is completed, the resulting "tree" is not equivalent to the hierarchical tree taught by Herz. According to Herz, each member of a lower cluster *is defined with the same specificity*, whereas in the present invention, not all members of a narrowly defined item slot group are defined with the same specificity (they all share a broad characteristic, but not all share the same narrow characteristic). Items of the first type fill item slots in item slot groups, but items of the first type do not express group characteristics, just meta characteristics. The Examiner has not articulated any reasonable motivation that would lead one of ordinary skill to modify Herz's method such that not all items in a lower cluster are defined with exactly the same specificity. The significance of appellants' claimed steps for filling the item slot groups is that the items of the second type are matched to open item slots with more specificity than items of the first type. Neither Herz nor Brown teach or suggest organizing items in this manner.

Not only does the suggested combination of Brown and Herz fail to achieve an equivalent to appellants' claimed invention for the reasons discussed above, a combination of Brown and Herz as proposed by the Examiner would be so computationally awkward that there is no reasonable motivation for making such a combination. Brown's original method expends computational resources before a request for ads is received (i.e., before the number of empty slots in an inventory is determined) to generate priority queues (organized lists of items/ads). The priority queues enable play lists to be generated using minimal computational resources, after a request for ads is received (i.e., before the number of empty slots in an inventory is determined), so that play lists can be generated very quickly. The organization of the play lists is based on the organization of the priority queues. Further organizing the play lists produced by Brown using the hierarchical sorting, as taught by Herz, would result in a plurality of even more highly organized play lists. However, there is no apparent benefit disclosed by Herz or Brown as to why the more highly organized play lists would be desirable, particularly because Brown's method appears to achieve targeted advertising using only priority queues to organize play lists. If the hierarchical sorting taught by Herz were applied to Brown's play lists, significant computational resources would need to be expended both before a request for ads is received (i.e., before the number of empty slots in an inventory is determined) to generate the priority queues, and after a request for ads is received (i.e., after the number of empty slots in an inventory is determined), to further organize the play list generated using the priority queues. This approach would clearly consume more computational resources, at a greater cost, and

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likely result in reducing the speed with which a result is achieved. Since a clear benefit would not be achieved, it certainly would not be obvious to combine these two references, as proposed by the Examiner.

Part of appellants' business model requires providing better ad matching to ads from paying advertisers (sponsors/items of the second type) than to ads from non-paying advertisers (members/items of the first type). While appellants' method consumes more computational resources *after* a request for ads is received (i.e., after the number of empty slots in an inventory is determined) than does Brown' method, and thus is likely slower at matching ads than Brown's method, appellants' method better supports appellants' business model. As noted above, Brown's configuration bifurcates the slow and computationally intensive queue building process as an off-line activity, and the computationally efficient generation of play lists from previously generated priority queues as a real-time activity. This configuration enables play-lists to be generated in real-time, with little computational resources. MPEP 2145 makes it clear that references cannot be combined where the references teach away from their combination. The Examiner's suggested combination (which has not been clearly articulated) combines Herz with Brown such that the play lists generated by Brown are organized according to the hierarchical clustering of Herz. This combination would require the consumption of large amounts of computational resources off-line to generate the priority queues (disclosed by Brown), as well as the consumption of significant computational resources after the play lists are generated (in real-time) to organize the play lists according to hierarchical clustering (as disclosed by Herz). Note that this combination requires significant computation resources to be expended both off-line and on-line in real-time. As Brown's original configuration was intended to bifurcate the relatively computationally intensive processes to be an off-line activity, and the relatively computationally efficient generation of play-lists as an on-line activity, the suggested combination goes against the teachings of Brown, and should not have been made.

Rejection of Claims 18 and 19 under 35 U.S.C. § 103

The Examiner has rejected Claims 18 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Brown et al. (U.S. Patent No. 6,026,368), in view of Herz (U.S. Patent No. 6,029,195). The Examiner indicates that Brown discloses an invention equivalent to that defined by appellants' claims, except for filling slots based on hierarchical clustering in which an item in a lower cluster is also a member of each cluster above, and each cluster below is defined more specifically. The Examiner relies on Herz for disclosing these steps. Appellants respectfully disagree for the following reasons.

Claims 18 and 19 are distinguishable over the cited art for at least four reasons. First, Claims 18 and 19 define organizational structures (item slot groups and meta item slot groups) wherein the total number of item slots in each organizational structure is equal, whereas this is not true with respect to the organizational structures disclosed in the cited art. Second, Claims 18 and 19 define filling item slot groups in a manner that clearly differs from the technique disclosed by Brown to fill play lists, even if Brown's play lists were further organized in accord with the hierarchical clustering disclosed by Herz. Third, Brown's bifurcation of computationally intensive off-line activities and computationally efficient on-line/real-time activities teaches away from the suggested combination of Brown and Herz, which would result in computationally intensive activities both off-line and on-line. Finally, Claims 18 and 19 recite that the empty item slots have characteristics, such that empty item slots can be organized into groups according to those characteristics.

The first, second and third reasons have already been discussed above in regards to the rejection of Claims 8, 13, and 20 over the same art. With respect to item slots that have characteristics that enable them to be organized into groups, note Claim 18 recites:

> a plurality of item slots, such that each item slot has both a meta characteristic and a group characteristic, each item slot is initially unfilled, each item slot is able to be filled by an item of the first type having a corresponding meta characteristic, and each item slot is able to be filled by an item of the second type having the corresponding meta characteristic and a corresponding group characteristic;

> using the plurality of item slots, constructing a plurality of item slot groups, such that item slots having the same group characteristic are included in the same item slot group.

As described in appellants' specification, the item slots that are empty correspond to spaces on webpages where banner ads can be posted (see page 12, lines 2-10). The webpages are associated with characteristics related to ad placement, including broad characteristics, such as sports, and narrow characteristics, such as football or baseball (see page 17, lines 1-9). In appellants' claimed invention, those empty spaces are counted, then grouped into organizational structures (item slot groups) based on their common narrow characteristics. Brown discloses several types of organizational structures, including priority queues and play lists. Priority queues are lists of ads organized according to rules defined by an analyst. Each "item slot" in a priority queue does not have any inherent characteristic. The Examiner has argued that a priority queue is a programmatic construct that is an organizational structure, and when initially constructed, includes a

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

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plurality of empty slots waiting to be filled with content. Those slots are filled with ads based on rules defined by an analyst. Until the analyst defines the rules, there are no characteristics associated with the empty slots of a priority queue. Also, the slots in Brown's play lists do not exhibit any characteristics until they are filled with content based on the priority queues. Brown simply does not teach or suggest an organizational structure equivalent to appellants' recited item slot groups, where empty item slots are organized based on shared characteristics. None of the disclosure provided by Herz suggests modifying the steps disclosed by Brown's to achieve appellants' steps of organizing empty item slots into organizational structures based on shared characteristics of the empty slots. Claim 19 employs slightly different language, but the basic concept of organizing empty slots into groups based on shared characteristics is still present. Because the cited art does not teach or suggest this feature of appellants' claimed invention, Claims 18 and 19 are clearly improperly rejected over this art.

Rejection of Claim 21 under 35 U.S.C. § 103

The Examiner has rejected Claim 21 under 35 U.S.C. § 103(a) as being unpatentable over Brown, in view of Herz. The Examiner indicates that Brown discloses an invention equivalent to that defined by appellants' claims, except for filling slots based on hierarchical clustering in which an item in a lower cluster is also a member of each cluster above, and each cluster below is defined more specifically. The Examiner indicates that these steps are disclosed by Herz. Appellants respectfully disagrees for the following reasons.

Claim 21 is distinguishable over the cited art for at least three reasons. First, Claim 21 defines organizational structures (item slot groups and meta item slot groups) wherein the total number of item slots in each type of organizational structure is equal, which is not true with respect to the organizational structures disclosed in the cited art. Second, Claim 21 defines filling item slot groups in a manner that is distinguishable over the technique disclosed by Brown to fill play lists, even if Brown's play lists are further organized in accord with the hierarchical clustering disclosed by Herz. Third, Brown's bifurcation of computationally intensive off-line activities and computationally efficient on-line/real-time activities teaches away from the suggested combination of Brown and Herz, which would result in computationally intensive activities both off-line and on-line. Each of these distinguishing characteristics have been discussed above in detail with respect to the rejection of Claims 8, 13, and 20. Accordingly, the rejection of Claim 21 is improper and should be withdrawn.

Rejection of Claims 1-7, 9-12, and 14-17 under 35 U.S.C. § 103

The Examiner has rejected Claims 1-7, 9-12, and 14-17 under 35 U.S.C. § 103(a) as being unpatentable over Brown, in view of Herz, and further in view of Conley, Jr. et al. (U.S. Patent No. 6,434,745). The Examiner indicates that Brown discloses an invention equivalent to that defined by appellants' claims, except for filling slots based on hierarchical clustering, and displaying a report about the slots as a histogram, but relies upon Herz and Conley for disclosing these elements.

As discussed in detail above, appellants specifically recite that before content is organized, the number of empty slots are determined. Then the item slots are organized into item slot groups, based on characteristics of the item slots. Brown does not teach or suggest organizing empty slots that exhibit characteristics into an organizational structure. As discussed above, the slots in Brown's priority queues can accept any ads identified using the rules determined by an analyst. The step disclosed by Brown that most closely relates to determining an inventory of empty slots is the request that a play list of a specific size be filled using the predetermined priority queues. According to Brown, the play list is filled based on the priority queues, and no further sorting or organization of the play list is required (i.e., the priority queues control the organization of the play list). Again, a distinction can be made as to expending computational resources *before* the number of empty slots is determined (as in Brown), versus doing so *after* the number of empty slots is determined (as in the present claimed invention). Combining Brown with Herz would require expending computational resources *both* before and after the number of empty slots is determined, resulting in a loss of efficiency, with no clear benefit being achieved. As noted above, Brown's bifurcation of computationally intensive off-line activities and computationally efficient on-line/real-time activities teaches away from the suggested combination of Brown and Herz, which would result in computationally intensive activities both off-line and on-line. Further, there would be no reason for one of ordinary skill in the art to produce a report based on a histogram by modifying the combination of Brown and Herz, as taught by Conley. Thus, for the reasons noted above, neither Brown, nor a combination of Brown, Herz, and Conley teach or suggest an invention that is equivalent to appellants' claimed invention.

CONCLUSION

The combination of prior art cited by the Examiner in rejecting Claims 8, 13, and 18-21 as unpatentable under 35 U.S.C. § 103 does not teach or suggest the invention defined by appellants in

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Bellevue, Washington 98004
Telephone: (425) 688-8816   Fax: (425) 646-6314

these claims. Specifically, the cited art fails to teach steps that are equivalent to appellants' recited steps for constructing item slot groups and meta item slot groups. The cited art also fails to teach filling more specifically defined organizational structures (item slot groups) with elements that share only a broad characteristic in common (a meta characteristic). Also, the hierarchical clusters disclosed by Herz do not allow for items sharing only a broad characteristic in the lower, more specifically defined clusters. Brown's bifurcation of computationally intensive off-line activities and computationally efficient on-line/real-time activities teaches away from the suggested combination of Brown and Herz, which as discussed above would result in computationally intensive activities both off-line and on-line.. Further, the combination suggested by the Examiner would logically result in a less computationally efficient process, which appears to provide no additional benefit to compensate for the loss in efficiency, and thus, a person of ordinary skill in the art would not be motivated to make this combination.

Similarly, the art cited by the Examiner in rejecting Claims 1-7, 9-12, and 14-17 as unpatentable under 35 U.S.C. § 103 does not teach or suggest the invention defined by appellants in these claims. Specifically, the cited art fails to teach steps that are equivalent to appellants' recited steps for constructing item slot groups after determining a number of empty slots in an inventory, such that item slot groups are constructed based on characteristics of the empty slots. Further, the combination suggested by the Examiner would logically result in a less computationally efficient process, which appears to provide no additional benefit to compensate for the loss in efficiency.

Appellants therefore request that the Board of Patent Appeals and Interferences overrule the Examiner's rejection of the claims and instruct that this application be passed to issue without delay.
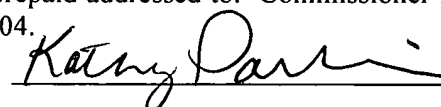
Respectfully submitted,

Ron Anderson

Ronald M. Anderson
Registration No. 28,829

APPENDIX

Claims on Appeal:

1. (Previously Presented) A computer-implemented method for allocating items to an available inventory of empty item slots, comprising the steps of:

determining a number of item slots available in an inventory that are empty, such that each item slot that is empty can be filled by either an item of a first type having a corresponding characteristic or an item of a second type having a corresponding characteristic, and wherein each item slot that is empty is filled by only a single item having the corresponding characteristic;

organizing the item slots that are empty into item slot groups, each different item slot group including only those item slots which can be filled by items having the same characteristic;

allocating each of a plurality of items of the first type to the item slots of the item slot groups that are unfilled by matching characteristics of the first type of items to characteristics of the item slot groups, such that allocating an item of the first type to an item slot fills the item slot with the item;

allocating each of a plurality of items of the second type to the item slots of the item slot groups that are unfilled by items of the first type by matching characteristics of the second type of items to the characteristics of the item slot groups, such that allocating an item of the second type to an item slot fills the item slot with the item; and

displaying the plurality of item slot groups as a histogram having a plurality of bars, where each bar corresponds to an item slot group and has a height corresponding to the number of item slots of the item slot group, wherein the bar has an indication as to how many of the number of item slots of the item slot group are filled and how many of the number of item slots of the item slot group are unfilled.

2. (Original) The method of claim 1, wherein each item comprises an ad and each item slot group comprises a web site, such that each item slot of the item slot group corresponds to an advertising space on the web site on which an ad can be shown.

3. (Previously Presented) The method of claim 2, wherein the first type of the plurality of items comprises sponsor ads, and the second type of the plurality of items comprises member ads.

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4. (Original) The method of claim 1, wherein each of the plurality of items of the first type has a fill quota, wherein allocating each of the plurality of the items of the first type comprises filling a number of item slots of the item slot groups that are unfilled with the item equal to the quota.

5. (Original) The method of claim 4, wherein allocating each of the plurality of the items of the first type further comprises filling the number of item slots of the item slot groups that are unfilled with the item equal to the quota proportionally as to the item slots unfilled of the item slot groups having characteristics matching the characteristics of the item.

6. (Original) The method of claim 1, wherein each of the plurality of items of the second type has a fill quota, wherein allocating each of the plurality of the items of the second type comprises filling a number of item slots of the item slot groups that are unfilled with the item equal to the quota.

7. (Original) The method of claim 6, wherein allocating each of the plurality of the items of the second type further comprises filling the number of item slots of the item slot groups that are unfilled with the item equal to the quota proportionally as to the item slots unfilled of the item slot groups having characteristics matching the characteristics of the item.

8. (Previously Presented) A computer-implemented method for allocating items to an available inventory of empty item slots, comprising the steps of:

determining a number of item slots available in an inventory that are empty, such that each item slot that is empty can be filled by either an item of a first type having a corresponding meta characteristic and no group characteristic, or an item of a second type having both a corresponding meta characteristic and a corresponding group characteristic, and wherein each item slot that is empty is filled by only a single item having the corresponding characteristic;

organizing the item slots that are empty into item slot groups, a different item slot group being constructed for each different group characteristic, such that each item slot that can be filled with an item having that group characteristic is included in that item slot group;

constructing a meta item slot group for each different meta characteristic that can be used to fill the item slots, each meta item slot group having a number of meta item slots equal to a total number of item slots that can be filled by items having that meta characteristic, each meta item slot being initially unfilled and able to be filled by an item having that meta characteristic;

allocating each of a plurality of items of a first type over the meta item slots of the meta item slot groups that are unfilled by matching meta characteristics of the first type of items to

the meta item slots, such that the meta item slots are filled only by items of the first type having the same meta characteristic, and allocating an item of the first type to a meta item slot fills the meta item slot with the item;

allocating each of a plurality of items of a second type over the meta item slots of the meta item slot groups that are unfilled by items of the first type by matching characteristics of the second type of items to the characteristics of the meta item slot groups, such that the meta item slots are filled only by items of the second type having the same meta characteristic, and allocating an item of the second type to a meta item slot fills the meta item slot with the item, thereby determining a number of items of the second type required to fill all meta item slots unfilled by items of the first type;

for each item of the second type that is allocated to a meta item slot, also allocating that item of the second type to an item slot that is unfilled by matching characteristics of the item of the second type to the characteristics of the item slot groups, such that each item slot is filled only by items of the second type having the same group characteristic and the same meta characteristic, and allocating an item of the second type to an item slot fills the item slot with the item; and

for each item of the first type that is allocated to a meta item slot, also allocating that item of the first type to an item slot that is unfilled by an item of the second type by matching characteristics of the first type of items to characteristics of the item slots, such that each item slot is filled only by items of the first type having the same meta characteristic, and allocating an item of the first type to an item slot fills the item slot with the item, thereby allocating items to an available inventory of empty item slots.

9. (Previously Presented) The method of claim 8, further comprising:

displaying the plurality of item slot groups as a first histogram having a plurality of bars, where each bar corresponds to an item slot group and has a height corresponding to the number of item slots of the item slot group, wherein the bar has an indication as to how many of the number of item slots of the item slot group are filled and how many of the number of item slots of the item slot group are unfilled; and,

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displaying the plurality of meta item slot groups as a second histogram having a plurality of bars, where each bar corresponds to a meta item slot group and has a height corresponding to the number of meta item slots of the meta item slot group, wherein the bar has an indication as to how many of the number of meta item slots of the meta item slot group are filled and how many of the number of meta item slots of the meta item slot group are unfilled.

10. (Previously Presented) The method of claim 8, wherein each item comprises an ad, each item slot group comprises a web site, and each meta item slot group comprises at least one web site having similar characteristics, such that each item slot of the item slot group corresponds to an advertising space on the web site on which an ad can be shown, and each meta item slot of the meta item slot group corresponds to an advertising space on a web site of the meta item slot group on which an ad can be shown.

11. (Original) The method of claim 10, wherein the first type of the plurality of items comprises member ads, and the second type of the plurality of items comprises sponsor ads.

12. (Original) The method of claim 8, wherein each of the plurality of the items of the first type and each of the plurality of the items of the second type has a fill quota, wherein allocating each of the plurality of the items comprises filling a number of item slots that are unfilled with the item equal to the quota.

13. (Previously Presented) A computer-implemented method for allocating items to an available inventory of empty item slots, comprising the steps of:

determining a number of item slots available in an inventory that are empty, such that each item slot that is empty can be filled by an item of a first type having a corresponding meta characteristic and no group characteristic, an item of a second type having a corresponding meta characteristic and a corresponding group characteristic, or an item having a corresponding meta characteristic, a corresponding group characteristic, and a corresponding sub group characteristic, and wherein each item slot that is empty will be filled by only a single item having the corresponding characteristics;

organizing the item slots that are empty into sub item slot groups, each item slot being initially unfilled and able to be filled by an item, such that each different sub item slot group includes only those item slots that can be filled by items having the same meta group, group, and sub group characteristics;

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organizing the sub item slot groups into item slot groups, such that each different item slot group includes only those sub item slot groups whose item slots can be filled by items having the same meta and group characteristics;

constructing a meta item slot group for each different meta characteristic that can be used to fill an item slot, each meta item slot group having a number of meta item slots equal to a total number of item slots that can be filled by items having the same meta characteristic, each meta item slot being initially unfilled and able to be filled by an item having a corresponding meta characteristic, an item having a corresponding meta characteristic and a corresponding group characteristic, or an item having a corresponding meta characteristic, a corresponding group characteristic, and a corresponding sub group characteristic, and wherein a meta item slot that is empty is filled by only a single item having the corresponding characteristics;

allocating a plurality of items of a first type over the meta item slots of the meta item slot groups that are unfilled by matching meta characteristics of the first type of items to meta characteristics of the meta item slot groups, such that allocating an item to a meta item slot fills the meta item slot with the item;

allocating each of a plurality of items of a second type over the meta item slots of the meta item slot groups that are unfilled, the item slots of the item slot groups that are unfilled, and the item slots of the sub item slot groups that are unfilled, by matching characteristics of the second type of items to respective characteristics of the meta item slot groups, of the item slot groups, and of the sub item slot groups, such that allocating an item to an item slot fills the item slot with the item, and allocating an item to a meta item slot fills the meta item slot with the item; and,

allocating each of a plurality of items of a second type over the meta item slots of the meta item slot groups that are unfilled by items of the first type, by matching meta characteristics, group characteristics, and sub group characteristics of the second type of items to respective characteristics of the meta item slots, such that allocating an item to an item slot fills the item slot with the item, thereby determining how many items of the second type are needed to fill the meta item slots unfilled by items of the first type;

for each item of the second type that is allocated to a meta item slot, also allocating that item of the second type to an item slot that is unfilled by matching meta, group, and sub group characteristics of the item of the second type to the meta, group, and sub group characteristics of the item slot, such that each item slot is filled only by items of the second type having the corresponding

meta, group, and sub group characteristics, and allocating an item of the second type to an item slot fills the item slot with the item; and

for each item of the first type that is allocated to a meta item slot, also allocating that item of the first type to an item slot that is unfilled by an item of the second type by matching meta characteristics of the first type of items to meta characteristics of the item slots, such that each item slot is filled only by items of the first type having the same meta characteristic, and allocating an item to an item slot fills the item slot with the item, thereby allocating items to an available inventory of empty item slots.

14. (Previously Presented) The method of claim 13, further comprising the steps of:

displaying the plurality of item slot groups as a first histogram having a plurality of sub-bars organized into a plurality of bars, where each sub-bar corresponds to a sub item slot group and has a height corresponding to the number of item slots of the sub item slot group, wherein the sub-bar has an indication as to how many of the number of item slots of the sub item slot group are filled and how many of the number of item slots of the sub item slot group are unfilled; and,

displaying the plurality of meta item slot groups as a second histogram having a plurality of bars, where each bar corresponds to a meta item slot group and has a height corresponding to the number of meta item slots of the meta item slot group, wherein the bar has an indication as to how many of the number of meta item slots of the meta item slot group are filled and how many of the number of meta item slots of the meta item slot group are unfilled.

15. (Previously Presented) The method of claim 13, wherein each item comprises an ad, each item slot group comprises a web site, each sub item slot group comprises a viewer type of web site, and each meta item slot group comprises at least one web site having similar characteristics, such that each item slot of the sub item slot group corresponds to an advertising space on the web site on which an ad can be shown to a particular viewer type, each item slot of the item slot group corresponds to an advertising space on the web site on which an ad can be shown, and each meta item slot of the meta item slot group corresponds to an advertising space on a web site of the meta item slot group on which an ad can be shown.

16. (Original) The method of claim 15, wherein the first type of the plurality of items comprises member ads, and the second type of the plurality of items comprises sponsor ads.

17. (Original) The method of claim 13, wherein each of the plurality of the items of the first type and each of the plurality of the items of the second type has a fill quota, wherein allocating each

of the plurality of the items comprises filling a number of item slots that are unfilled with the item equal to the quota.

18. (Previously Presented) A computer-implemented method for distributing items of a first type and items of a second type into item slots arranged in a plurality of item slot groups, wherein items of the second type are defined with a greater granularity than items of the first type, such that items of the second type can have group and meta characteristics, while items of the first type have meta characteristics but not group characteristics, comprising the steps of:

providing:

a plurality of items of the first type, each item of the first type having a meta characteristic;

a plurality of items of the second type, each item of the second type having both a group characteristic and a meta characteristic;

a plurality of item slots, such that each item slot has both a meta characteristic and a group characteristic, each item slot is initially unfilled, each item slot is able to be filled by an item of the first type having a corresponding meta characteristic, and each item slot is able to be filled by an item of the second type having the corresponding meta characteristic and a corresponding group characteristic;

using the plurality of item slots, constructing a plurality of item slot groups, such that item slots having the same group characteristic are included in the same item slot group;

constructing a meta item slot group for each different meta characteristic, each meta item slot group so constructed including a number of meta item slots equal to the number of the item slots sharing the same meta characteristic, each meta item slot being initially unfilled, and able to be filled by either an item of the first type having the same meta characteristic, or an item of the second type having the same meta characteristic;

allocating each of the plurality of items of the first type over the meta item slots that are unfilled by matching meta characteristics of the first type of items to meta characteristics of the meta item slots, such that allocating an item to a meta item slot fills the meta item slot with the item;

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allocating each of the plurality of items of the second type over the meta item slots that are not already filled by items of the first type, by matching meta characteristics of the second type of items to meta characteristics of the meta item slots, such that allocating an item to a meta item slot fills the meta item slot with the item, thereby determining a number of items of the second type required to fill all meta item slots unfilled by items of the first type;

for each item of the second type allocated over a meta item slot, also allocating that item of the second type over an item slot in an item slot group by matching meta and group characteristics of the item of the second type to respective meta and group characteristics of the item slot, such that allocating an item to an item slot fills the item slot with the item; and

for each item of the first type allocated over a meta item slot, also allocating that item of the first type over an unfilled item slot in an item slot group by matching meta characteristics of the item of the first type of items to meta characteristics of the item slot, such that allocating an item to an item slot fills the item slot with the item, thereby distributing items of the first type and items of the second type into item slots arranged in a plurality of item slot groups.

19. (Previously Presented) A computer-implemented method for distributing items of a first type and items of a second type into item slots arranged in a plurality of sub item slot groups and item slot groups, wherein items of the second type are defined with a greater granularity than items of the first type, comprising the steps of:

providing:

a plurality of items of the first type, each item of the first type having a meta characteristic;

a plurality of items of the second type, each item of the second type having a sub group characteristic, a group characteristic, and a meta characteristic;

a plurality of item slots, each item slot having a meta characteristic, a group characteristic, and a sub group characteristic, each item slot being initially unfilled and able to be filled by an item of the first type having the corresponding meta characteristic and no group characteristic, and each item slot being able to be filled by an item of the second type having the corresponding meta characteristic, the corresponding group characteristic, and the corresponding sub group characteristic, wherein an item slot that is empty is filled by only a single item having the corresponding characteristics;

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organizing the plurality of item slots into sub item slot groups, such that each different sub item slot group includes only those item slots that can be filled by items having the same meta characteristics, group characteristics, and sub group characteristics;

organizing the sub item slot groups into item slot groups, such that each different item slot group includes only those sub item slot groups whose item slots can be filled by items having the same meta characteristics and group characteristics;

constructing a meta item slot group for each different meta characteristic of the item slots, each meta item slot group including a number of meta item slots equal to the number of the item slots having the same meta characteristic, each meta item slot being initially unfilled and able to be filled by an item of the first type having the corresponding meta characteristic, and an item of the second type having the corresponding meta characteristic, the corresponding group characteristic, and the corresponding sub group characteristic, such that an empty meta item slot is filled by only a single item having the corresponding characteristic;

allocating each of the plurality of items of the first type over the meta item slots that are unfilled by matching meta characteristics of the first type of items to the meta item slots, such that allocating an item to a meta item slot fills the meta item slot with the item;

allocating each of the plurality of items of the second type over the meta item slots that are not already filled by items of the first type, by matching meta characteristics, group characteristics, and sub group characteristics of the second type of items to the meta item slots, such that allocating an item to a meta item slot fills the meta item slot with the item, thereby determining a number of items of the second type required to fill all meta item slots unfilled by items of the first type;

for each item of the second type that is allocated over a meta item slot, also allocating that item of the second type over an item slot in a sub item slot group by matching meta characteristics, group characteristics, and sub group characteristics of the second type of items to the item slots, such that allocating an item to an item slot fills the item slot with the item, thereby filling the item slots with the same number of items of the second type that filled the meta item slots;

for each item of the first type allocated over a meta item slot, also allocating that item of the first type over an unfilled item slot in an item slot group by matching meta characteristics of the item to meta characteristics of the item slot, such that allocating an item to an item slot fills the item slot with the item, thereby distributing items of the first type and items of the second type into item slots arranged in a plurality of sub item slot groups.

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20. (Previously Presented) A computer-implemented method for allocating items to an available inventory of empty item slots, comprising the steps of:

determining a number of item slots available in an inventory that are empty, such that each item slot that is empty can be filled by either an item of a first type having a corresponding broad characteristic and no narrow characteristic, or an item of a second type having both a corresponding broad characteristic and a corresponding narrow characteristic, and wherein each item slot that is empty is filled by only a single item having the corresponding characteristic;

organizing the item slots that are empty into item slot groups, such that each item slot group includes only those item slots that can be filled by items of the second type having the same narrow characteristic;

constructing a meta item slot group for each different broad characteristic that can be used to fill the item slots, each meta item slot group having a number of meta item slots equal to a total number of item slots that can be filled by items having that broad characteristic, each meta item slot being initially unfilled, and able to be filled by an item having the same broad characteristic;

allocating a plurality of items of a first type over the meta item slots by matching broad characteristics of the first type of items to broad characteristics of the meta item slot, such that allocating an item of the first type to a meta item slot fills the meta item slot with the item;

allocating a plurality of items of a second type over the meta item slots that are not filled by items of the first type by matching broad characteristics of the second type of items to broad characteristics of the meta item slot, such that allocating an item of the second type to a meta item slot fills the meta item slot with the item, thereby determining how many items of the second type can be accommodated in the item slots;

for each item of the second type that is allocated to a meta item slot, also allocating that item of the second type to an item slot that is unfilled, by matching narrow characteristics of the second type of items to narrow characteristics of the item slot, such that allocating an item of the second type to an item slot fills the item slot with the item, thereby filling a first portion of the item slots;

for each item of the first type that is allocated to a meta item slot, also allocating that item of the first type to an item slot that is unfilled by an item of the second type, by matching broad characteristics of the first type of items to broad characteristics of the item slot, such that allocating an item of the first type to an item slot fills the item slot with the item, thus filling the remaining

portion of the item slots, thereby allocating items of the first type and the second type to the available inventory of empty item slots.

21. (Previously Presented) A computer-implemented method comprising the steps of:

constructing a plurality of item slot groups, each item slot group having a number of item slots, each item slot initially unfilled and able to be filled by an item;

constructing a plurality of meta item slot groups, each meta item slot group encompassing at least one item slot group and having a number of meta item slots equal to a total number of item slots of the at least one item slot group the meta item slot group encompasses, each meta item slot initially unfilled and able to be filled by an item;

allocating each of a plurality of items of a first type over the meta item slots of the meta item slot groups that are unfilled by matching characteristics of the first type of items to characteristics of the meta item slot groups, such that allocating an item to a meta item slot fills the meta item slot with the item, each item of the first type not having any characteristics corresponding to a specific item slot group;

allocating each of a plurality of items of a second type over both the meta item slots of the meta item slot groups that are unfilled and the item slots of the item slot groups that are unfilled by matching characteristics of the second type of items to the respective characteristics of the item slot groups and the meta item slot groups, such that allocating an item to an item slot fills the item slot with the item, and allocating an item to a meta item slot fills the meta item slot with the item; and,

for each meta item slot group, allocating each of the plurality of items of the first type that have been allocated to a meta item slot over the item slots of the at least one item slot group encompassed by that meta item slot group that are unfilled, such that allocating an item to an item slot fills the item slot.

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